

CLAIMS

1. A clip applier for applying a surgical clip in a patient, comprising:
a disposable cartridge including an elongate tube having a proximal end
5 and a distal end, a pair of opposing jaw members extending outwardly from the
distal end of the elongate tube, and a ratchet mechanism; and
a reusable actuating mechanism coupled to the proximal end of the
elongate tube to move the jaw members between an open position and a closed
position.

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2. The clip applier of Claim 1, wherein the ratchet mechanism is a
one-way ratchet providing a full actuating stroke of the clip applier.

15 3. The clip applier of Claim 1, wherein the ratchet mechanism is
formed from injection molded plastic.

4. The clip applier of Claim 1, wherein said actuating mechanism
comprises:

20 a main body connected to the proximal end of the elongate tube; and
an actuating handle coupled to the main body such that movement of the
handle in relation to the main body forces the jaw members to move relative to
each other between the open position and the closed position.

25 5. The clip applier of Claim 1, wherein said cartridge further comprises
a push member for advancing the clip into the jaw members.

6. The clip applier of Claim 5, wherein said cartridge further comprises a biasing spring for maintaining said push member against the clip.

7. The clip applier of Claim 6, wherein said cartridge further comprises 5 a drive coupling operatively connected to a sliding ratchet pawl for engaging with mating teeth formed on an inner surface of the elongate tube.

8. The clip applier of Claim 7, wherein the ratchet pawl includes a cantilever arm that engages with the mating teeth.

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9. The clip applier of Claim 7, wherein the drive coupling provides a central connection of the ratchet pawl allowing a degree of pivoting and improved seating of the mating teeth.

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10. A method of applying a surgical clip to an object in a patient during a surgical procedure using a clip applier having a disposable cartridge and a reusable actuating mechanism, said disposable cartridge including an elongate tube having a proximal end and a distal end, a pair of opposing jaw members extending outwardly from the distal end of the elongate tube, and a ratchet mechanism, said actuating mechanism coupled to the proximal end of the elongate tube to move the jaw members between an open position and a closed position, said method comprising the steps of:

positioning the clip applier within the patient such that the jaw members are adjacent to the object to be clipped;

25 closing the jaw members and the clip over the object; and

removing the clip applier from the patient.

11. The method of Claim 10, wherein the clip applier provides a full actuating stroke of the ratchet mechanism before returning to its original position
5 by pressing the actuating mechanism.

12. The method of Claim 10, wherein said actuating mechanism comprises:

10 a main body connected to the proximal end of the elongate tube; and
an actuating handle coupled to the main body such that movement of the handle in relation to the main body forces the jaw members to move relative to each other between the open position and the closed position.

13. The method of Claim 10, following the positioning step, further
15 comprising the steps of:

orienting the clip applier such that the jaw members pass over the object;
manipulating the jaw members to move the object to a compressed state
within the jaw members; and
advancing the clip over the object to maintain the object in the
20 compressed state.

14. The method of Claim 13, further comprising the step of retracting a feeder to allow the next clip to be fed into the jaw members.

25 15. A clip applier for applying a surgical clip in a patient, comprising:

a disposable cartridge including a housing member having a proximal portion and a distal portion, a pair of opposing jaw members extending outwardly from the distal portion of the housing member, and a ratchet mechanism; and

5 a reusable actuating mechanism coupled to the cartridge to move the jaw members between an open position and a closed position.

16. The clip applier of Claim 15, wherein the ratchet mechanism is a one-way ratchet providing a full actuating stroke of the clip applier.

10 17. The clip applier of Claim 15, wherein the ratchet mechanism is formed from injection molded plastic.

18. The clip applier of Claim 15, wherein said actuating mechanism comprises:

15 a plurality of tips connected to said jaws members; and
 an actuating handle coupled to the tips such that movement of the handle in relation to the tips forces the jaw members to move relative to each other between the open position and the closed position.

20 19. The clip applier of Claim 15, wherein said cartridge further comprises a jaw loader for advancing the clip into the jaw members.

20. The clip applier of Claim 19, wherein said cartridge further comprises a biasing spring for maintaining said jaw loader against the clip.

21. The clip applier of Claim 20, wherein said cartridge further comprises a drive bushing operatively connected to the housing member and to the jaw loader for engaging with mating teeth formed on an inner surface of the housing member.

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22. The clip applier of Claim 21, wherein the drive bushing includes a cantilever arm that engages with the mating teeth.

23. The clip applier of Claim 21, wherein the drive bushing provides a 10 central connection of the jaw loader allowing a degree of pivoting and improved seating of the mating teeth.

24. A method of applying a surgical clip to an object in a patient during a surgical procedure using a clip applier having a disposable cartridge and a 15 reusable actuating mechanism, said disposable cartridge including a housing member having a proximal portion and a distal portion, a pair of opposing jaw members extending outwardly from the distal portion of the housing member, and a ratchet mechanism, said actuating mechanism coupled to the cartridge to move the jaw members between an open position and a closed position, said method 20 comprising the steps of:

positioning the clip applier within the patient such that the jaw members are adjacent to the object to be clipped;
closing the jaw members and the clip over the object; and
removing the clip applier from the patient.

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25. The method of Claim 24, wherein the clip applier provides a full actuating stroke of the ratchet mechanism before returning to its original position by pressing the actuating mechanism.

5 26. The method of Claim 24, following the positioning step, further comprising the steps of:

orienting the clip applier such that the jaw members pass over the object; manipulating the jaw members to move the object to a compressed state within the jaw members; and

10 advancing the clip over the object to maintain the object in the compressed state.

27. The method of Claim 26, further comprising the step of retracting a jaw loader to allow the next clip to be fed into the jaw members.